

APPENDIX D

AIR QUALITY

APPENDIX D-1

REGULATIONS

APPENDIX D – AIR QUALITY

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Federal Regulations/Standards

In 1982, an *Air Quality Plan* for the Air Basin, as required by the 1977 CAA Amendments, was adopted and incorporated into the original California State Implementation Plan (SIP). The 1982 *Air Quality Plan* described the air pollution control strategies necessary to bring the Bay area into attainment for all of the National Ambient Air Quality Standards (NAAQS) by 1987. This deadline passed, and the Bay Area remained in nonattainment for O₃, PM₁₀, and CO.

The 1990 California Clean Air Act Amendments gave the EPA new authority to define the boundaries of nonattainment areas. The San Francisco Bay Area Air Basin was categorized as moderate for O₃, CO, and PM₁₀. The 1990 CAA Amendments required that, within 2 or 3 years of enactment (November 15 1990), the state submit an SIP to the EPA. California's proposed SIP is currently being reviewed by the EPA. In the meantime, the EPA has issued a federal implementation plan (FIP) for California, with implementation of specific rules delayed for 2 years to provide time for completion of SIP review and possible replacement of the "interim" FIP with California's proposed SIP.

Between 1990 and 1994, the Bay Area had met the federal ozone standard, and had requested that the EPA grant a redesignation to attainment status. In 1992, for the first time since the monitoring of CO began (over 30 years ago), there were no exceedances of the federal or state CO standards in the nine-county region. A request for redesignation to attainment status was made for CO as well.

The EPA redesignated the Bay Area in attainment of the 1-hour National Ozone Standard on May 22, 1995. The agency did this because the Bay Area attained the ozone standard for 5 years (1990 – 1994). EPA also approved an *Ozone Maintenance Plan* submitted by the "co-lead" agencies (i.e., the Metropolitan Transportation Commission and the ABAG) for federal air quality planning in the Bay Area.

In the summers of 1995 and 1996, the Bay Area experienced hot, stagnant weather. This led to exceedances of the 1-hour ozone standard. The "contingency measures" in the *Maintenance Plan* were not adequate to bring the region back into compliance with the standard. EPA was not satisfied that the region's adopted and projected actions would be sufficient to reestablish compliance with the standard.

EPA published a notice that revoked the region's clean air status on July 10, 1998. The notice called for the region to submit three plan elements:

- 1995 Emission Inventory for Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NO_x) (these two pollutants combine to form O₃),
- Assessment of the Emission Reductions Needed to Attain the National Ozone Standard by 2000 (the "Attainment Assessment"), and
- A Control Strategy.

In June 1999, the BAAQMD adopted the 1999 Ozone Attainment Plan that included these 3 elements and 11 new control measures. In addition, two voluntary measures were included in the Plan. These include the Spare the Air Program (1999 and 2000 ozone seasons only) and Low Emission Alternatively Fueled Vehicles and Infrastructure. The Ozone Attainment Plan was created to help reestablish the Bay Area's attainment record by providing 60 tons per day of VOC and NO_x reductions between 1998 and 2000. In addition, contingency measures were included in the 1999 Plan in the event that existing and proposed control measures were not sufficient to attain the standard by the deadline. On March 30, 2001, U.S. EPA proposed to partially approve and partially disapprove the 1999 Plan. The following parts of the 1999 Plan were disapproved: attainment assessment, transportation emissions budgets, and reasonably

1 available control measures (RACM) demonstration. On August 28, 2001, EPA took final action on their
2 March 2001 notice, triggering a Clean Air Act requirement that a new plan be submitted within one year of
3 the effective date of EPA's final action. In response, the three co-lead agencies (BAAQMD, the
4 Metropolitan Transportation Commission, and the Association of Bay Area Governments) proposed to
5 correct deficiencies in the 1999 Plan by preparing a 2001 Ozone Attainment Plan.
6

7 In October 2001, the BAAQMD adopted the 2001 Ozone Attainment Plan, including the necessary
8 changes to the three elements EPA disapproved. The 2001 Plan also contains a new emissions
9 inventory; commitments to adopt and implement additional control measures to attain the standard by
10 2006, the attainment deadline; and additional contingency measures in the event the Bay Area does not
11 attain the standard by 2006. In the 2001 Plan, the District commits to strengthen the Smog Check
12 program by requesting the State Bureau of Automotive Repair to implement two VOC-reducing program
13 elements. The new measures and on-going programs will provide 271 tons per day of combined VOC and
14 NO_x emission reductions between 2000 and 2006. The 2001 Plan also includes a new attainment
15 assessment based on currently available data for the Bay Area. The Bay Area co-lead agencies have
16 committed to reassess the attainment assessment in 2003 using data from the Central California Ozone
17 Study and to submit a revised SIP to U.S. EPA in 2004 with any needed modifications to the control
18 strategy. On November 30, 2001, the Air Resource Board submitted the 2001 Plan to U.S. EPA for
19 approval as a revision to the California SIP. On February 14, 2002, U.S. EPA determined that the motor
20 vehicle emission budgets in the Bay Area's 2001 Ozone Attainment Plan are adequate for conformity
21 purposes. The U.S. EPA is currently reviewing the 2001 Ozone Attainment Plan.
22

23 In February 2003, the U.S. EPA issued final regulations to control emissions from mid-size and large
24 marine vessels. The rule requires all new U.S.-built tankers, bulk carries, container and cruise ships to
25 meet International Maritime Organization standards for nitrogen oxides (NO_x) by 2004. The U.S. EPA
26 also switched from a voluntary to a mandatory NO_x emission requirement for medium-sized marine
27 vessels (700 to 11,000 horsepower), such as tugboats and commercial vessels. The new standard
28 applies through 2006, with a new emission threshold established in 1999 going into effect in 2007.
29

30 **State Regulations/Standards**

31

32 California began setting air quality standards in 1969 with the passage of the Mulford-Carrell Act, before
33 NAAQS were established. Because of unique meteorological problems in the state and the differences of
34 opinion from medical panels established by the California Air Resources Board (CARB) and the EPA
35 regarding pollutant levels that protect susceptible members of the population from adverse health impacts
36 with an adequate degree of safety, there are considerable differences between state and federal
37 standards currently in effect in California (see Section 3.6.2.3). In addition to its more stringent ambient
38 air quality standards, California uses more stringent regulations than the federal government for vehicle
39 emissions, under a program administered by CARB.
40

41 These standards are the levels of air quality considered safe, with an adequate margin of safety, to
42 protect the public health and welfare. They are designed to protect those "sensitive receptors" most
43 susceptible to respiratory distress, such as asthmatics, the elderly, very young children, people already
44 weakened by other disease or illness, and persons engaged in strenuous work or exercise. A description
45 of each pollutant type and its effects is presented below.
46

47 Ozone (O₃)

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49 O₃ is one of a number of substances called photochemical oxidants that are formed when reactive
50 organic gases (ROG) and NO_x, both byproducts of the internal combustion engine, react in the presence
51 of ultraviolet sunlight. O₃ is present in relatively high concentrations in the air basin, and the damaging
52 effects of photochemical smog are generally related to the concentrations of O₃. O₃ may pose its worst
53 health threat to those who already suffer from respiratory diseases. This health problem is particularly
54 acute in sensitive receptors such as the sick, the elderly, and young children. O₃ levels peak during the
55 summer and early fall months.
56

Carbon Monoxide (CO)

CO is a colorless, odorless, toxic gas that is produced by incomplete combustion of carbonous substances (e.g., gasoline or diesel fuel). The primary adverse health effect associated with CO is the interference of normal oxygen transfer to the blood, which may result in tissue oxygen deprivation.

Fine Particulate Matter (PM₁₀)

PM₁₀ consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists with an aerodynamic diameter of 10 microns (i.e., ten one-millionths of a meter or 0.0004 inch) or less. Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities. However, wind action on the arid landscape also contributes significantly to the local PM₁₀ loading. PM₁₀ may adversely affect the human respiratory system, especially in those people who are naturally sensitive or susceptible to breathing problems.

Nitrogen Dioxide (NO₂)

NO₂ is a byproduct of fuel combustion. The principle form of NO₂ produced by combustion is nitric oxide (NO), but NO reacts quickly to form NO₂, creating the mixture of NO and NO₂ commonly called NO_x. NO₂ acts as an acute irritant and, in equal concentrations, is more injurious than NO. At atmospheric concentrations, however, NO₂ is only potentially irritating. There is some indication of a relationship between NO₂ and chronic pulmonary fibrosis. Some increase in bronchitis in children (2 and 3 years old) has also been observed at concentrations below 0.3 parts per million (ppm). NO₂ absorbs blue light, the result of which is a brownish-red cast to the atmosphere and reduced visibility. NO₂ also contributes to the formation of PM₁₀.

Sulfur Dioxide (SO₂)

SO₂ is a colorless, pungent, irritating gas formed by the combustion of sulfurous fossil fuels. Fuel combustion is the primary source of SO₂. At sufficiently high concentrations, SO₂ may irritate the upper respiratory tract. At lower concentrations and when combined with particulates, SO₂ may do greater harm by injuring lung tissue.

Lead (Pb)

Pb in the atmosphere occurs as particulate matter. In the past the combustion of leaded gasoline was the primary source of lead emissions. Other sources of lead include the manufacturing of batteries, paint, ink, ceramics, and ammunition, and secondary lead smelters. With the phase-out of leaded gasoline, secondary lead smelters and battery recycling and manufacturing facilities are becoming lead emission sources of greater concern. Prolonged exposure to atmospheric lead poses a serious threat to human health.

Reactive Organic Gases (ROG)

ROGs, also referred to as precursor organic compounds (POCs), are compounds comprised primarily of atoms of hydrogen and carbon. Internal combustion associated with motor vehicles is the major source of hydrocarbons. Adverse effects on human health are not caused directly by ROG, but rather by reactions of ROG to form secondary air pollutants including O₃. Note that for the purposes of this analysis, ROG, precursor organic compounds (POC), reactive organic compounds (ROC), volatile organic compounds (VOC), and non-methane hydrocarbons (NMHC), are used synonymously.

Fugitive Dust

Fugitive dust poses primarily two public health and safety concerns. The first concern is that of respiratory problems attributable to the suspended particulates in the air. The second concern is that of

motor vehicle accidents caused by reduced visibility during severe wind conditions. Fugitive dust may also cause significant property damage during strong wind storms by acting as an abrasive material agent (much like sandblasting activities).

The California Clean Air Act (CCAA), which became effective on January 1, 1989, provides a planning framework for attainment of the California Ambient Air Quality Standards (CAAQS). Nonattainment areas in the state were required to prepare plans for attaining the CAAQS. The CCAA provided for the classification of regions within the state into four classes: "moderate," "serious," "severe," and "extreme." Regional classifications are determined by monitoring data taken during the 1989-1991 baseline period, as follows:

Ozone

<u>Classification</u>	<u>Highest 1-Hour Level</u>
Moderate	0.09 ppm to 0.12 ppm
Serious	0.13 ppm to 0.15 ppm
Severe	0.16 ppm to 0.20 ppm
Extreme	> 0.20 ppm

Carbon Monoxide

<u>Classification</u>	<u>Highest 8-Hour Level</u>
Moderate	9.0 ppm to 12.7 ppm
Serious	> 12.7 ppm

For regions in any class, attainment plans are required to demonstrate a 5 percent per year reduction in the emissions of nonattainment pollutants or their precursors, unless all feasible measures are being employed.

The 1990 CAA Amendments represent a major revision of the original statute. They specify new strategies for attaining federal air quality standards, including mandatory 3 percent annual reductions of air pollutant emissions in areas exceeding federal standards, new offset requirements for new stationary sources of air pollutants, the scheduled introduction of low-emitting cars and trucks into the motor vehicle fleet, and the development of alternatives to the private automobile as the primary means of transportation.

BAAQMD and the Clean Air Plan (CAP)

The *Bay Area 1991 Clean Air Plan (CAP)*, adopted on October 30, 1991, was prepared in response to requirements of the CCAA. The Plan included methods to lower ground-level O₃ in the San Francisco Bay Area and included a comprehensive strategy to reduce air pollution throughout the Basin. The 1991 CAP focused on control measures to be implemented during the 1991 to 1994 period, and also included control measures to be implemented from 1995 through the year 2000 and beyond.

The Plan was updated to the *Bay Area 1994 CAP* in 1994 and serves as a continuation of the comprehensive strategy established in 1991. The 1994 Plan included changes in the organization and scheduling of some 1991 CAP measures and also includes eight new proposed stationary and mobile source control measures. The 1994 CAP included a comprehensive strategy to reduce air pollutant emissions, focused on control measures to be implemented during the 1994 to 1997 period, and also included control measures to be implemented from 1998 through the year 2000 and beyond.

The *Bay Area 1997 CAP* was adopted on December 17, 1997 as a revision to the *Bay Area 1994 CAP*. It served as a continuation of the comprehensive strategy established in the region's first plan, the 1991 CAP, to attain the state ozone standard. The 1997 CAP included changes in the organization and scheduling of some 1994 CAP control measures and also included 12 proposed new stationary and mobile source control measures, as well as 2 new transportation control measures. The 1997 CAP covered the period extending from the date of adoption to 2000. It also included projections of pollutant trends and possible emission reduction activities beyond 2000.

1 The *Bay Area 2000 CAP* was adopted by the BAAQMD Board of Directors at a public hearing on
2 December 20, 2000 and was then submitted to the California Air Resources Board. The 2000 CAP is the
3 third triennial update of the District's original 1991 CAP. The 2000 CAP includes a control strategy review
4 to ensure that the plan continues to include "all feasible measures" to reduce ozone, an update of the
5 District's emission inventory, estimates of emission reductions achieved by the plan, and an assessment
6 of air quality trends.

7 8 **Listing of Applicable Laws, Regulations, and Standards**

9 10 Federal Regulations/Standards

- 11
12 ➤ The Federal Clean Air Act of 1970 directs the attainment and maintenance of National Ambient Air
13 Quality Standards (NAAQS). The 1990 Amendments to this Act determine attainment and
14 maintenance of NAAQS (Title I), motor vehicles and fuel reformulation (Title II), hazardous air
15 pollutants (Title III), acid deposition (Title IV), operating permits (Titles V), stratospheric ozone
16 protection (Title VI), and enforcement (Title VII).
- 17
18 ➤ The U.S. Environmental Protection Agency (U.S. EPA) implements New Source Review (NSR) and
19 Prevention of Significant Deterioration (PSD). PSD applies to major sources with annual emissions
20 exceeding either 100 or 250 tons per year (TPY) depending on the source, or that cause or contribute
21 adverse impacts to any Federally classified Class I area.
- 22
23 ➤ The U.S. EPA implements the NAAQS and determines attainment of federal air quality standards on a
24 short- and long-term basis.

25 26 State Regulations and Laws

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28 ➤ The California Air Resources Board (CARB) has established the California Ambient Air Quality
29 Standards (CAAQS) and determines attainment status for criteria air pollutants.
- 30
31 ➤ The California Clean Air Act (CCAA) went into effect on January 1, 1989 and was amended in 1992.
32 The CCAA mandates achieving the health-based CAAQS at the earliest practicable date.
- 33
34 ➤ The California Health and Safety Code, Division 26 Air Resources, Part 6 Air Toxics Hot Spots
35 Information and Assessment, Section 44300, requires an inventory of air toxics emissions from
36 individual existing facilities, an assessment of health risk, and notification of potential significant
37 health risk when found to be present.
- 38
39 ➤ California Health and Safety Code, Division 26 Air Resources, Chapter 6 Facility Toxic Air
40 Contaminant Risk Reduction Audit and Plan, Section 44390, provides guidelines to identify a more
41 realistic health risk, requires high risk facilities to submit an air toxic emission reduction plan, holds air
42 districts accountable for ensuring that the plans will achieve their objectives and that high risk facilities
43 will be required to achieve their planned emission reduction.
- 44
45 ➤ California Health and Safety Code, Division 26 Air Resources, Chapter 3.5 Toxic Air Contaminants,
46 Article 2.5 Coordination with the Federal Act, Section 39656, sets forth provisions to implement the
47 Federal program for hazardous air pollutants.
- 48
49 ➤ California Health and Safety Code, Division 26 Air Resources, Part 4 Nonvehicular Air Pollution
50 Control, Chapter 4 Enforcement, Section 42301.6, requires new or modified sources of air
51 contaminants located within 1,000 ft. from the outer boundary of a school to give public notice to the
52 parents of school children before an air pollution permit is granted.
- 53
54 ➤ Section 21151.4 of the California Public Resources Code, Division 13 Environmental Quality, Chapter
55 4 Local Agencies, addresses Hazardous Air Pollutant releases within one-fourth mile of a school site.
- 56

BAAQMD and Other Regional Agencies Plans and Programs

- **Bay Area Air Quality Plan (1979 and 1982).** This BAAQMD plan is a regional plan required by the federal government to address how the Bay Area will attain the NAAQS.
- **Ozone Maintenance Plan (1993).** In June 1995, the U.S. EPA approved the request of BAAQMD, Metropolitan Transportation Commission (MTC), and Association of Bay Area Government (ABAG) to redesignate the Bay Area as an attainment area of the NAAQS for ozone. The U.S. EPA also approved the Ozone Maintenance Plan at that time. However, in 1998, the Bay Area was again redesignated to nonattainment for the national ozone standard.
- **1999 Ozone Attainment Plan.** In June 1999, the BAAQMD adopted the 1999 Ozone Attainment Plan. The Ozone Attainment Plan was created to help reestablish the Bay Area's attainment record by providing 60 tons per day of VOC and NO_x reductions between 1998 and 2000. On March 30, 2001, U.S. EPA proposed to partially approve and partially disapprove the 1999 Plan.
- **2001 Ozone Attainment Plan.** In October 2001, the BAAQMD adopted the 2001 Ozone Attainment Plan, including the necessary changes to the three elements EPA disapproved in the 1999 Ozone Attainment Plan. On November 30, 2001, the Air Resource Board submitted the 2001 Plan to U.S. EPA for approval as a revision to the California SIP. On February 14, 2002, U.S. EPA determined that the motor vehicle emission budgets in the Bay Area's 2001 Ozone Attainment Plan are adequate for conformity purposes. The U.S. EPA is currently reviewing the 2001 Ozone Attainment Plan.
- **Carbon Monoxide Maintenance Plan (1994).** A San Francisco Bay Area Redesignation Request and Maintenance Plan for the Carbon Monoxide NAAQS was adopted in 1994 by the three regional agencies. In 1998, U.S. EPA redesignated the Bay Area as an attainment area for the national CO standard.
- **Bay Area Clean Air Plan (1991, 1994, 1997, and 2000).** Prepared by BAAQMD in cooperation with MTC and ABAG, its main objective is to attain the State air quality standards for ozone. The CAP presents a comprehensive strategy to reduce emissions from stationary, area, and mobile sources.
- **Toxic Air Contaminant Control Program.** The Toxic Air Contaminant Control Program is a regional program administered by the BAAQMD. Its main objective is to reduce public exposure to toxic air contaminants.
- **Odorous Substances Regulation.** The BAAQMD has enacted an odorous substance control program as part of its effort to control the use and emission of odorous substances within the Bay Area.
- **Regional Transportation Plan (1994).** The Metropolitan Transportation Commission's Regional Transportation Plan guides Bay Area transportation system improvement projects and shows how they will help attain regional air quality objectives.
- **Congestion Management Program.** The main goals of the Congestion Management Plan, which is prepared by the county Congestion Management agencies, are to establish a political process through which countywide roadway congestion can be controlled or relieved, and to develop a comprehensive strategy to respond to countywide transportation needs.